



10 CFR 50.73

LG-19-086

August 5, 2019

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Limerick Generating Station, Unit 2  
Renewed Facility Operating License No. NPF-85  
NRC Docket No. 50-353

Subject: LER 2019-001-00, Valid Actuation of the Reactor Protection System due to a Trip of  
D214-24 Load Center

Enclosed is a Licensee Event Report (LER) addresses a valid actuation of the reactor protection system (RPS) due to a trip of the D214-24 Load Center at Limerick Generating Station, Unit 2. The manual scram was due to lower condenser vacuum following a loss of power to the Offgas System.

This LER is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(iv)(A).

There are no commitments contained in this letter.

If you have any questions, please contact Robert B. Dickinson at (610) 718-3400.

Respectfully,

A handwritten signature in black ink, appearing to read "F. Sturniolo", written over a horizontal line.

Frank Sturniolo  
Acting Vice President – Limerick Generating Station  
Exelon Generation Company, LLC

cc: Administrator Region I, USNRC  
USNRC Senior Resident Inspector, Limerick Generating Station



## LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc/collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001 or by e-mail to [Infocollcts.Resource@nrc.gov](mailto:Infocollcts.Resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NE08-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor and a person is not required to respond to, the information collection.

1. Facility Name Limerick Generating Station, Unit 2	2. Docket Number 05000 353	3. Page 1 OF 3
---	-------------------------------	-------------------

4. Title Valid Actuation of the Reactor Protection System due to a Trip of D214-24 Load Center
---

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Rev No.	Month	Day	Year	Facility Name	Docket Number
06	04	19	2019	- 001	- 00	08	05	19	Facility Name	Docket Number 05000

9. Operating Mode	11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)			
1	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
10. Power Level	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
100	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(2)(ii)
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(iii)
	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> Other (Specify in Abstract below or in NRC Form 366A)		

12. Licensee Contact for this LER	
Licensee Contact Robert B. Dickinson	Telephone Number (Include Area Code) 610-718-3400

13. Complete One Line for each Component Failure Described in this Report									
Cause D	System WF	Component LC	Manufacturer B042	Reportable to ICES Yes	Cause	System	Component	Manufacturer	Reportable to ICES
14. Supplemental Report Expected					15. Expected Submission Date				
<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date) <input checked="" type="checkbox"/> No					Month Day Year				

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On June 3, 2019, with Limerick Unit 2 at approximately 100% power, the D214-24 Load Center tripped due to an invalid undervoltage signal; resulting in de-energization of a 480 VAC Divisional Motor Control Center (MCC) D214-G-D. The power failure impacted several components in the Offgas System resulting in water building up in the system and causing stalling of the Steam Jet Air Ejectors and a resultant degradation of Main Condenser vacuum. At 01:45 June 4, Operators inserted a manual SCRAM due to Main Condenser vacuum approaching the Main Turbine trip setpoint. The cause of the event is the procedure used to stabilize the plant did not fully address the loss of power to the Offgas System. The corrective action is to revise the procedures used to stabilize the plant to address the loss of power to the Offgas System.

**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Limerick Generation Station, Unit 2	05000- 353	19	001	00

**NARRATIVE****Unit Condition Prior to the Event**

Unit 2 was in Operational Condition (OPCON) 1 (Run) at approximately 100 percent power. There were no structures, systems or components out of service that contributed to this event.

**Description of the Event**

On June 3, 2019, with Limerick Unit 2 at approximately 100% power, the D214-24 Load Center tripped due to an invalid undervoltage signal; resulting in de-energization of a 480 VAC Divisional Motor Control Center (MCC) D214-G-D [EC]. Operators took immediate actions to stabilize the plant in accordance with procedure E-D214-G-D for loss of the MCC.

With the loss of control power, the 'A' After-Condenser Drain Valve failed closed. This prevented the automatic draining of the Unit 2 Offgas [WF] Recombiner After-Condenser. As a result, the After-Condenser and downstream piping slowly filled with water. At 22:36 water was entering the Offgas System pipes as indicated by After-Condenser outlet temperatures decreasing, and holdup pipe outlet temperature rising.

The Unit 2 'B' After-Condenser Drain Valve Level Controller was placed in Auto which began draining the Offgas System of water. However, water already in the Offgas System blocked flow through the Offgas System, increasing backpressure at the second stage stream jet air ejectors. This backpressure stalled the stream jet air ejectors. At approximately 01:22, Unit 2 began to lose Main Condenser vacuum. As Main Condenser vacuum was lost, Operations lowered reactor power. At 01:45, Operations initiated a manual scram due to degrading condenser vacuum.

**Analysis of the Event**

Following the scram, troubleshooting was performed to identify the cause of the fuse failure. The troubleshooting identified that the upper lead on the undervoltage relay had degradation of the insulation and exposed the conductor. This resulted in a short of the 'A' phase to ground, causing the 'A' phase fuse to fail, which de-energized the MCC.

The Offgas Recombiner After-Condenser system is designed with a redundant drain cooler drain valve to maintain level in the After-Condenser. The in service After-Condenser drain cooler valve was operating in the automatic mode and the redundant drain cooler valve was in the manual mode and closed, by design. With the loss of power to the in service After-Condenser drain cooler valve, the in-service valve closed. The controller for the in service After-Condenser drain cooler controller failed in the AS IS position.

The procedure used to stabilize the plant contained immediate actions but did not fully address the Offgas System. With the redundant After-Condenser drain cooler valve controller in the manual mode the system required Operator action to return the system to service. The immediate actions in procedure E-D214-G-D did not instruct the Operator to place the redundant offgas controller train into service.

**Safety Consequences**

There was no actual safety consequence associated with this event. The potential safety consequences of this event were minimal. All control rods were verified to be fully inserted following the manual RPS actuation. Operators performed required safety actions in accordance with procedures and training. The trip was not complex with all systems responding normally.

**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
Limerick Generation Station, Unit 2	05000- 353	YEAR 19	SEQUENTIAL NUMBER 001	REV NO. 00

**NARRATIVE****Cause of the Event**

The root cause of the event is a lack of technical rigor in the development and subsequent revisions of E-D214-G-D which resulted in inadequate procedural direction for operators to stabilize the plant. The procedure was revised due to a similar event in 2009; however, the revision was overly reliant on the simulator response to the condition and did not use the electrical prints to verify the plant response.

**Corrective Actions**

The corrective action is to conduct a review of plant procedures for response to unexpected loss of electrical busses to ensure proper procedural guidance is contained in the procedure based on a review of the electrical prints.

**Previous Similar Occurrences**

On January 31, 2009, during performance of a drywell unit cooler surveillance test, an electrical fault occurred on the line side of a 480 VAC MCC feeder breaker which resulted in the de-energization of the entire MCC. This issue caused a loss of chilled water to the drywell chillers resulting in a power reduction to 70 percent power. This event identified inadequate procedural direction for operators to stabilize the plant. The procedures that address the loss of various MCCs were revised to improve the procedural direction.

**System: Offgas**

Component: Level Controller

Component Number: LIC-069-235A

Component Name: AFTCOND. DRAIN COOLER DRAIN VLV. 'A' CONTROL STATION (LV)

Manufacturer: Bailey Controls

Mode Number: 7040